

***ABSTRACT OF THE DISCLOSURE***

There is provided robust diameter-controlled optical fiber during optical fiber drawing process and an optical fiber drawing process which comprises drawing the optical fiber from a preform therefor under tension to form the optical fiber while heating and melting the preform, wherein an outer diameter of the preform is measured (at a safe position immediately) above the furnace, an outer diameter of the optical fiber on which no coating has been provided is measured at one process position or two process positions before coating, and drawing conditions are robustly controlled based on the deviation of the measured optical fiber diameter data and the measured preform diameter data from a preselected outer diameter of the optical fiber and a preselected outer diameter of the preform.